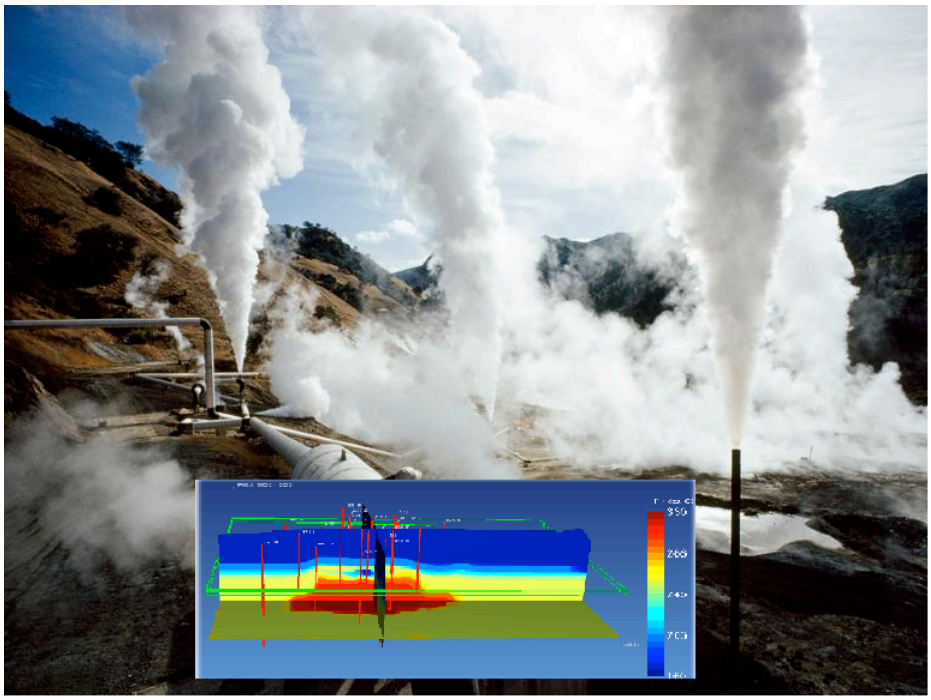
GEOTHERMICS

Lithosphere heat flow and its relationships with tectonics, seismicity, crustal fluid circulation, and geothermal resources



The main topic of the research is the terrestrial heat flow. This parameter constitutes the principal surface boundary constraint for inferring the thermal structure of the lithosphere which is related to a number of geodynamic processes (such as extension, subduction, thrust folding, and seismic activity). Circulation of fluids in crust is known to bias the lithosphere heat-flow data, which are usually interpreted under the assumption of a purely conductive thermal regime. Thus, one of the main goals of the research is the better understanding of advective versus conductive heat transfer in continental and oceanic regions. This is crucial for a better modeling of the lithosphere thermal structure. This research therefore focuses on advances in geothermics in relation to tectonic, rheological, seismological and crustal fluid flow processes that can contribute to improved understanding of the lithosphere thermal regime. We use both experimental and theoretical approaches to discriminate the relative importance of heat transfer by conduction and fluid flow. The study of subsurface thermal regimes is also important in terms of geothermal energy applications, which in their different technical aspects (electrical and direct uses, ground-source heat pumps, etc.) are becoming more prominent in the frame of the renewable and sustainable energy sources.

Keywords: Terrestrial heat flow**,** lithosphere thermal regime**,** geothermal energy

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